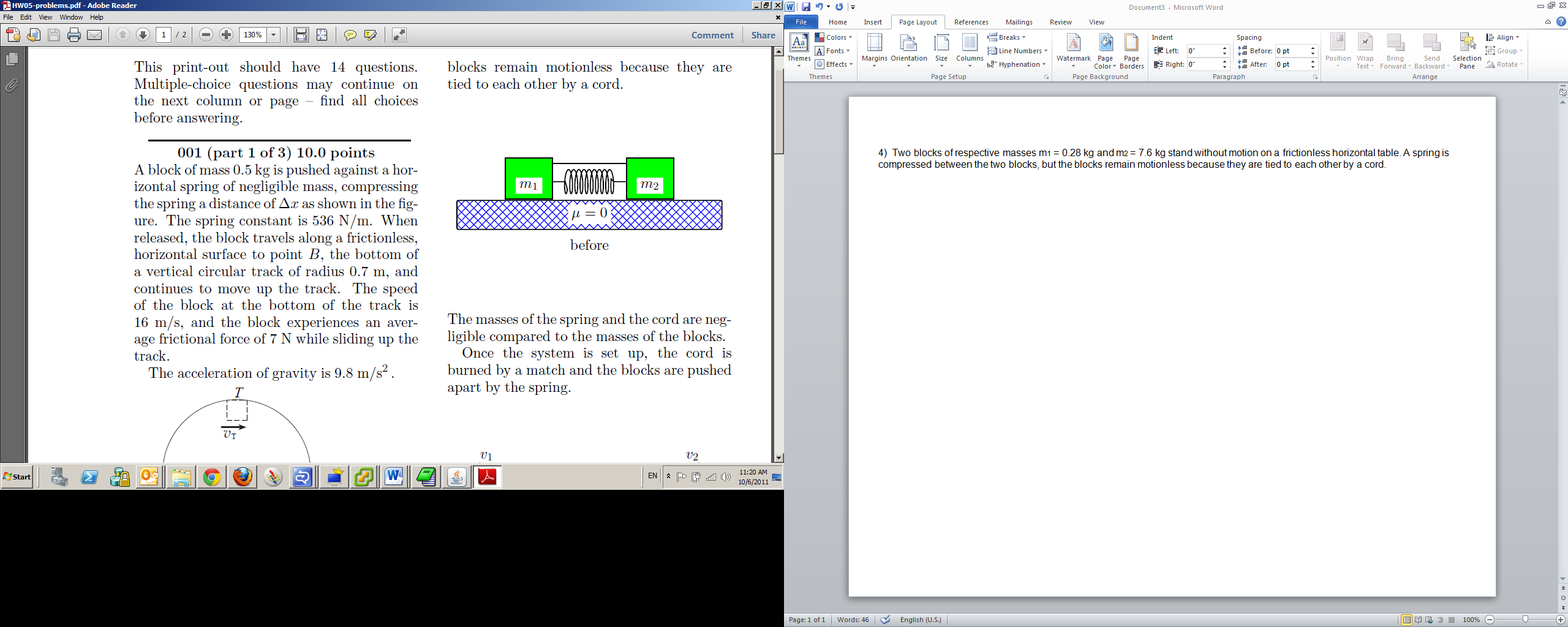
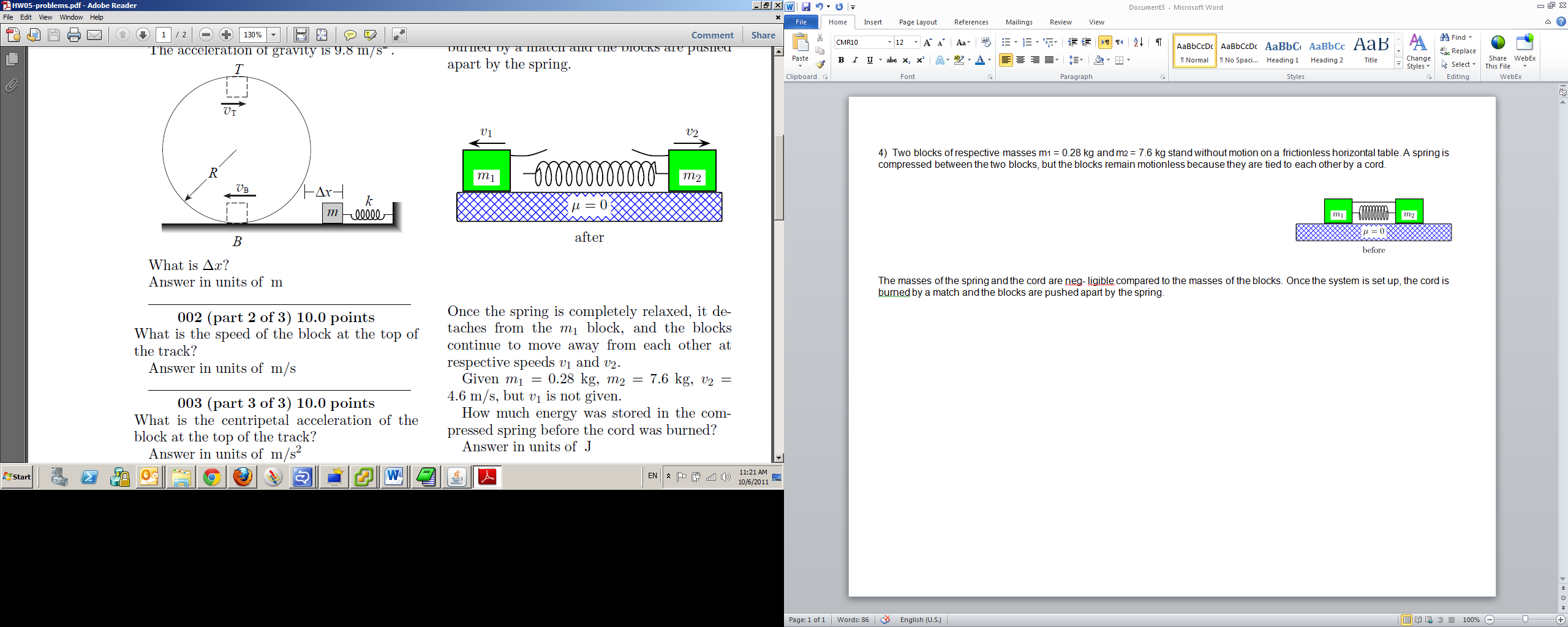
4) Two blocks of respective masses m1 = 0.28 kg and m2 = 7.6 kg stand without motion on a frictionless horizontal table. A spring is compressed between the two blocks, but the blocks remain motionless because they are tied to each other by a cord.



The masses of the spring and the cord are neg-ligible compared to the masses of the blocks. Once the system is set up, the cord is

burned by a match and the blocks are pushed apart by the spring.

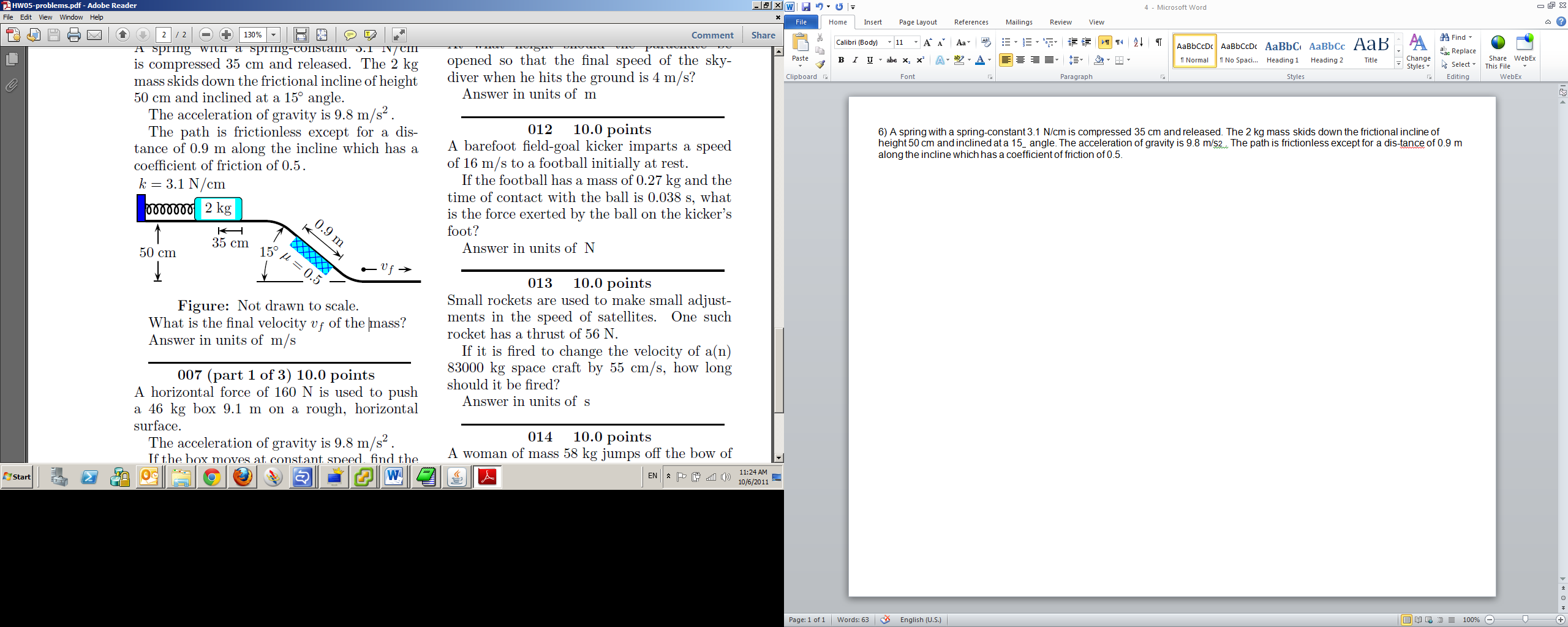


Once the spring is completely relaxed, it de-taches from the m1 block, and the blocks continue to move away from each other at respective speeds v1 and v2. Given m1 = 0.28 kg, m2 = 7.6 kg, v2 = 4.6 m/s, but v1 is not given.

How much energy was stored in the com-pressed spring before the cord was burned?

Answer in units of J

6) A spring with a spring-constant 3.1 N/cm is compressed 35 cm and released. The 2 kg mass skids down the frictional incline of height 50 cm and inclined at a 15\_ angle. The acceleration of gravity is 9.8 m/s2 . The path is frictionless except for a dis-tance of 0.9 m along the incline which has a coefficient of friction of 0.5.



What is the final velocity vf of the mass?

Answer in units of m/s

10) (part 1 of 2) An 86 kg skydiver jumps out of an airplane at an altitude of 1097 m and opens the parachute at an altitude of 193 m. The total retarding force on the diver is constant at 50 N with the parachute closed and constant at 1611 N with the parachute open. The acceleration of gravity is 9.8 m/s2 .What is the speed of the diver when helands on the ground?

Answer in units of m/s

(part 2 of 2) At what height should the parachute be opened so that the final speed of the sky-diver when he hits the ground is 4 m/s?

Answer in units of m

13) Small rockets are used to make small adjust-ments in the speed of satellites. One such rocket has a thrust of 56 N. If it is fired to change the velocity of a(n) 83000 kg space craft by 55 cm/s, how long should it be fired?

Answer in units of s

14) A woman of mass 58 kg jumps off the bow of a 52 kg canoe that is intially at rest. If her velocity is 4.5 m/s to the right, what is the velocity of the canoe after she jumps?

Answer in units of m/s*i*ˆ